

General

Title

Acute myocardial infarction: median time from hospital arrival to primary PCI in acute myocardial infarction (AMI) patients with ST-segment elevation or LBBB on the ECG performed closest to hospital arrival time.

Source(s)

Specifications manual for national hospital inpatient quality measures, version 3.1a. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2010 Apr 1. various p.

Measure Domain

Primary Measure Domain

Process

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the [Measure Validity](#) page.

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the median time from hospital arrival to primary percutaneous coronary intervention (PCI) in acute myocardial infarction (AMI) patients with ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival time.

This measure rate could be analyzed in conjunction with the measure rate for the related measure [Acute myocardial infarction: percent of patients with ST-segment elevation or LBBB on the ECG closest to arrival time receiving primary PCI during the hospital stay with a time from hospital arrival to PCI of 90 minutes or less](#). These measures, used together, will assist in understanding the median time to primary PCI, and will identify the number of AMI patients that are receiving primary PCI within 90 minutes of hospital arrival and potential opportunities for improvement to decrease the median time to primary PCI.

Rationale

The early use of primary angioplasty in patients with ST-segment myocardial infarction (STEMI) results in a significant reduction in mortality and morbidity. The earlier primary coronary intervention is provided, the more effective it is (Brodie, 1998 and DeLuca, 2004). National guidelines recommend the prompt initiation of percutaneous coronary intervention (PCI) in patients presenting with STEMI (Antman, 2004).

Primary Clinical Component

Acute myocardial infarction (AMI); ST-segment elevation; left bundle branch block (LBBB); primary percutaneous coronary intervention (PCI)

Denominator Description

Acute myocardial infarction (AMI) patients with ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival who received primary percutaneous coronary intervention (PCI) within 24 hours after hospital arrival (see the related "Denominator Inclusions/Exclusions" field)

Numerator Description

Continuous variable statement: Time (in minutes) from hospital arrival to primary percutaneous coronary intervention (PCI) in patients with ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival

Evidence Supporting the Measure

Evidence Supporting the Criterion of Quality

A clinical practice guideline or other peer-reviewed synthesis of the clinical evidence

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Evidence Supporting Need for the Measure

Need for the Measure

Use of this measure to improve performance

Evidence Supporting Need for the Measure

Antman EM, Anbe DT, Armstrong PW, Bates ER, Green LA, Hand M, Hochman JS, Krumholz HM, Kushner FG, Lamas GA, Mullany CJ, Ornato JP, Pearle DL, Sloan MA, Smith SC Jr. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction. A report of the Am Coll of Cardiol/American Heart Assoc Task Force on Practice Guidelines (Committee to revise the 1999 guidelines). Bethesda (MD): American College of Cardiology (ACC), American Heart Association (AHA); 2004. 211 p. [1398 references]

Brodie BR, Stuckey TD, Wall TC, Kissling G, Hansen CJ, Muncy DB, Weintraub RA, Kelly TA. Importance of time to reperfusion for 30-day and late survival and recovery of left ventricular function after primary angioplasty for acute myocardial infarction. J Am Coll Cardiol. 1998 Nov;32(5):1312-9. [PubMed](#)

DeLuca G, Suryapranata H, Ottervanger JP, Antman EM. Time delay to treatment and mortality in primary angioplasty for acute myocardial infarction: every minute of delay counts. Circulation. 2004 Mar 16;109(10):1223-5. [PubMed](#)

Krumholz HM, Anderson JL, Bachelder BL, Fesmire FM, Fihn SD, Foody JM, Ho PM, Kosiborod MN, Masoudi FA, Nallamothu BK, American College of Cardiology/American Heart Association Task Force on Performance Measures, American Academy of Family Physicians, American College of Emergency Physicians, American Association of Cardiovascular and Pulmonary Rehabilitation, Society for Cardiovascular Angiography and Interventions, Society of Hospital Medicine. ACC/AHA 2008 performance measures for adults with ST-elevation and non-ST-elevation myocardial infarction [trunc]. J Am Coll Cardiol. 2008 Dec 9;52(24):2046-99.

State of Use of the Measure

State of Use

Current routine use

Current Use

Accreditation

Collaborative inter-organizational quality improvement

External oversight/Medicaid

External oversight/Medicare

Internal quality improvement

Application of Measure in its Current Use

Care Setting

Hospitals

Professionals Responsible for Health Care

Measure is not provider specific

Lowest Level of Health Care Delivery Addressed

Single Health Care Delivery Organizations

Target Population Age

Age greater than or equal to 18 years

Target Population Gender

Either male or female

Stratification by Vulnerable Populations

Unspecified

Characteristics of the Primary Clinical Component

Incidence/Prevalence

In 2010, an estimated 785,000 Americans will have a new coronary event, and approximately 470,000 will have a recurrent event. An estimated additional 195,000 silent first myocardial infarctions occur each year. Approximately every 25 seconds, an American will have a coronary event, and approximately every minute, one will die. In 2004, AMI resulted in 695,000 hospital stays and \$31 billion in health expenditures. The risk of further cardiovascular complications, including recurrent MI, sudden cardiac death, heart failure, stroke, and angina pectoris, among AMI survivors is substantial.

Evidence for Incidence/Prevalence

Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, De Simone G, Ferguson TB, Ford E, Furie K, Gillespie C, Go A, Greenlund K, Haase N, Hailpern S, Ho PM, Howard V, Kissela B, Kittner S, Lackland D, Lisabeth L, Marelli A, McDermott MM, Meigs J, Mozaffarian D, Mussolino M, Nichol G, Roger VL, Rosamond W, Sacco R, Sorlie P, Roger VL, Thom T, Wasserthiel-Smoller S, Wong ND, Wylie-Rosett J, American Heart Association Statistics Committee and Stroke Statistics, Writing Group Members. Heart disease and stroke statistics--2010 update: a report from the American Heart Association. *Circulation*. 2010 Feb 23;121(7):e46-e215. [PubMed](#)

Association with Vulnerable Populations

Unspecified

Burden of Illness

See the "Incidence/Prevalence" field.

Utilization

See the "Incidence/Prevalence" field.

Costs

See the "Incidence/Prevalence" field.

Institute of Medicine (IOM) Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Timeliness

Data Collection for the Measure

Case Finding

Users of care only

Description of Case Finding

Discharges, 18 years of age and older, with a principal diagnosis of acute myocardial infarction (AMI) with ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival *and* primary percutaneous coronary intervention (PCI) within 24 hours after hospital arrival

Denominator Sampling Frame

Patients associated with provider

Denominator Inclusions/Exclusions

Inclusions

Discharges, 18 years of age and older, with an International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Principal Diagnosis Code for acute myocardial infarction (AMI) *and* ICD-9-CM Principal and Other Procedure Codes for percutaneous coronary intervention (PCI) as defined in Appendix A, Tables 1.1 and 1.2, of the original measure documentation *and* ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival *and* primary PCI performed within 24 hours after hospital arrival

Exclusions

- Patients less than 18 years of age
- Patients who have a Length of Stay (LOS) greater than 120 days
- Patients enrolled in clinical trials
- Patients received as a transfer from an acute care facility where they were an inpatient or outpatient
- Patients received as a transfer from one distinct unit of the hospital to another distinct unit of the same hospital
- Patients received as a transfer from the emergency department of another hospital
- Patients administered fibrinolytic agent prior to PCI
- PCI described as non-primary by a physician/advanced practice nurse/physician assistant (physician/APN/PA)
- Patients who did not receive PCI within 90 minutes and had a reason for delay documented by a

physician/APN/PA (e.g., social, religious, initial concern or refusal, cardiopulmonary arrest, balloon pump insertion, respiratory failure requiring intubation)

Relationship of Denominator to Numerator

All cases in the denominator are equally eligible to appear in the numerator

Denominator (Index) Event

Clinical Condition

Institutionalization

Therapeutic Intervention

Denominator Time Window

Time window brackets index event

Numerator Inclusions/Exclusions

Inclusions

Continuous variable statement: Time (in minutes) from hospital arrival to primary percutaneous coronary intervention (PCI) in patients with ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival

Exclusions

None

Measure Results Under Control of Health Care Professionals, Organizations and/or Policymakers

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

Numerator Time Window

Fixed time period

Data Source

Administrative data

Medical record

Level of Determination of Quality

Not Individual Case

Pre-existing Instrument Used

Unspecified

Computation of the Measure

Scoring

Continuous Variable

Interpretation of Score

Better quality is associated with a lower score

Allowance for Patient Factors

Unspecified

Standard of Comparison

External comparison at a point in time

External comparison of time trends

Internal time comparison

Prescriptive standard

Prescriptive Standard

National guidelines recommend that a percutaneous coronary intervention (PCI) be performed within 90 minutes of hospital arrival in patients with ST-elevation myocardial infarction.

Evidence for Prescriptive Standard

Antman EM, Anbe DT, Armstrong PW, Bates ER, Green LA, Hand M, Hochman JS, Krumholz HM, Kushner FG, Lamas GA, Mullany CJ, Ornato JP, Pearle DL, Sloan MA, Smith SC Jr. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction. A report of the Am Coll of Cardiol/American Heart Assoc Task Force on Practice Guidelines (Committee to revise the 1999 guidelines). Bethesda (MD): American College of Cardiology (ACC), American Heart Association (AHA); 2004. 211 p. [1398 references]

Evaluation of Measure Properties

Extent of Measure Testing

The core measure pilot project was a collaboration among The Joint Commission, five state hospitals associations, five measurement systems, and 83 hospitals from across nine states. Participating hospitals collected and reported data for acute myocardial infarction (AMI) measures from December 2000 to December 2001.

Core measure reliability visits were completed the summer of 2001 at a random sample of 16

participating hospitals across 6 states.

Preliminary data from the pilot project show an average median rate of 310.85 minutes (5.2 hours) for time to percutaneous transluminal coronary angioplasty (PTCA), indicating an opportunity for improvement.

This measure is reviewed bi-annually and revised as needed to ensure reliable specifications. An independent abstracting contractor is utilized by the Hospital Inpatient Quality Reporting Program to monitor validity of the measure specifications. Feedback from this contractor is incorporated into the proposed changes for each manual update.

Evidence for Reliability/Validity Testing

Telligen, Hospital Inpatient Quality Reporting Program Support Contractor. Hospital Inpatient Quality Reporting Program data validation inclusion list. [internet]. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); [updated 2013 May 22]; [accessed 2012 Jul 31].

The Joint Commission. A comprehensive review of development and testing for national implementation of hospital core measures. Oakbrook Terrace (IL): The Joint Commission; 40 p.

Identifying Information

Original Title

AMI-8: median time to primary PCI.

Measure Collection Name

National Hospital Inpatient Quality Measures

Measure Set Name

Acute Myocardial Infarction

Submitter

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

The Joint Commission - Health Care Accreditation Organization

Developer

Centers for Medicare & Medicaid Services/The Joint Commission - None

Funding Source(s)

All external funding for measure development has been received and used in full compliance with The Joint Commission's Corporate Sponsorship policies, which are available upon written request to The Joint Commission.

Centers for Medicare & Medicaid Services (CMS) funding is from the United States Government.

Composition of the Group that Developed the Measure

This measure grew from Cooperative Cardiovascular Project (CCP) work. The Joint Commission co-developed this measure. The original versions of this measure have undergone revisions over the years, and have evolved into the current version which exists in the "Specifications Manual for National Hospital Inpatient Quality Measures" today.

The current Technical Expert Panel responsible for maintaining this measure includes representatives from the following organizations:

American College of Physicians
Duke University
American Medical Association
American College of Cardiology
Heart Failure Society of America
Agency for Healthcare Research and Quality
The Joint Commission
Mayo Foundation
Yale University
American Heart Association
Denver Veterans Affairs Medical Center
Mid America Heart Institute

Financial Disclosures/Other Potential Conflicts of Interest

Expert panel members have made full disclosure of relevant financial and conflict of interest information in accordance with the Conflict of Interest policies, copies of which are available upon written request to The Joint Commission and the Centers for Medicare & Medicaid Services (CMS).

Expert panel members have made full disclosure of relevant financial and conflict of interest information in accordance with the Conflict of Interest policies outlined in "A Blueprint for the CMS Measures Management System, Version 7" developed by the Health Services Advisory Group, Inc. available at the [CMS Web site](#) . Copies are available upon written request to CMS.

Adaptation

Measure was not adapted from another source.

Release Date

2000 Aug

Revision Date

2010 Apr

Measure Status

This is the current release of the measure.

This measure updates a previous version: Specifications manual for national hospital quality measures, version 3.0b. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2009 Oct. various p.

Source(s)

Specifications manual for national hospital inpatient quality measures, version 3.1a. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2010 Apr 1. various p.

Measure Availability

The individual measure, "AMI-8: Median Time to Primary PCI," is published in "Specifications Manual for National Hospital Inpatient Quality Measures." This document is available from [The Joint Commission Web site](#) . Information is also available from the [QualityNet Web site](#) . Check The Joint Commission Web site and QualityNet Web site regularly for the most recent version of the specifications manual and for the applicable dates of discharge.

Companion Documents

The following are available:

A software application designed for the collection and analysis of quality improvement data, the CMS Abstraction and Reporting Tool (CART), is available from the [CMS CART Web site](#) . Supporting documentation is also available. For more information, e-mail CMS PROINQUIRIES at proinquiries@cms.hhs.gov.

The Joint Commission. A comprehensive review of development and testing for national implementation of hospital core measures. Oakbrook Terrace (IL): The Joint Commission; 40 p. This document is available in Portable Document Format (PDF) from [The Joint Commission Web site](#) .

The Joint Commission. Attributes of core performance measures and associated evaluation criteria. Oakbrook Terrace (IL): The Joint Commission; 5 p. This document is available in PDF from [The Joint Commission Web site](#) .

NQMC Status

This NQMC summary was originally completed by ECRI on February 7, 2003. This NQMC summary was updated by ECRI Institute on October 6, 2005, April 16, 2007, and October 26, 2007. The Joint Commission informed NQMC that this measure was updated on August 13, 2008 and provided an updated version of the NQMC summary. This NQMC summary was updated accordingly by ECRI Institute on November 11, 2008. The information was verified by the Centers for Medicare & Medicaid Services (CMS) on January 22, 2009. The Joint Commission informed NQMC that this measure was updated again on October 1, 2009 and provided an updated version of the NQMC summary. This NQMC summary was updated accordingly by ECRI Institute on November 25, 2009. The information was verified by CMS on February 18, 2010. This NQMC summary was updated again by ECRI Institute on October 8, 2010. The information was verified by The Joint Commission on December 3, 2010. The information was verified by CMS on January 6, 2011.

Copyright Statement

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Joint Commission. Users of the Specifications Manual for National Hospital Inpatient Quality Measures should periodically verify that the most up-to-date version is being utilized.

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